GWOU ADMINISTRATIVE RECORD
SECTION TITLE:
GW-500-502-1.07

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

87354

MAY 26 2000

Mr. Glenn Hachey
Chair, Weldon Spring Citizens Commission
100 North Third Street - Room 107
St. Charles, Missouri 63301

Dear Mr. Hachey:

Re: Weldon Spring Site Groundwater Operable Unit

Enclosed for your information and use is a copy of the Environmental Protection Agency's (EPA) decision letter concluding the dispute process on the groundwater operable unit remedy. We are aware that the Commission has taken a keen interest in the groundwater remedy and in the outcome of this dispute. If you feel it would be useful, we would be happy to meet with the Commission or any interested members of the community to further explain EPA's views on this matter and to discuss where we go from here. It is our understanding that the MDNR and the DOE would also be willing to participate in such a meeting.

Thank you for your interest. If you would like to discuss this, I can be reached at (913) 551 - 7710.

Sincerely,

Daniel R. Wall
Remedial Project Manager

Enclosures

cc: Steve McCracken, WSSRAP
Bob Geller, MDNR

024404

MAY 30 2000 RECYCLE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

87354

MAY 12 2000

Mr. Steve Mahfood
Director
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Mr. Rodney Nelson
Assistant Manager for Environmental Management (EM-90)
U.S. Department of Energy
P.O. Box 2001
Oak Ridge, Tennessee 37830

Dear Messrs. Mahfood and Nelson:

Re: Weldon Spring Site Groundwater Operable Unit

We appreciate the considerable time and the effort you and members of your staff have spent trying to reach an agreement on a proposed remedial action for the Weldon Spring Groundwater Operable Unit. We especially appreciated your willingness to travel to Kansas City on a very snowy day in late January so that we could meet face-to-face to discuss issues of great concern to the Missouri Department of Natural Resources (MDNR), the Department of Energy (DOE), and the Environmental Protection Agency (EPA) Region VII. In September 1999, when DOE, MDNR, and EPA were unable to resolve these issues informally, MDNR sought to invoke the dispute resolution procedure in the First Amended Federal Facility Agreement (FFA). However, since the state of Missouri is not a party to the FFA, MDNR could not invoke the FFA's dispute resolution process.

To accommodate MDNR's desire for a more formal process, Region VII suggested that the parties follow a process similar to the dispute resolution procedure in the FFA to resolve MDNR's issues. A copy of the October 14, 1999, letter setting forth Region VII's proposal is enclosed as Enclosure A. The proposed process closely paralleled the dispute resolution procedure in the FFA. The party wishing to raise a dispute, MDNR in this instance, was to submit a statement of the issues it wanted to be addressed. These issues would first be considered by "branch chief level" representatives of the parties, with any issues that remained unresolved being elevated to higher management levels. Any issues that could not be resolved at the "program manager" level were to be decided by the Regional Administrator. DOE would extend the public comment period on the proposed remedial action to allow information

developed during this process to be included in the administrative record and to give the public the opportunity to comment on any changes in the proposed remedial action that might come out of the process before any remedial action decision became final. The parties agreed to this approach.

By letter dated November 10, 1999, MDNR identified four outstanding issues to be addressed using this process. A copy of this letter is enclosed as Enclosure B. From late November through the end of December 1999, party representatives consistent with EPA's branch chief level met in person and by conference call to discuss these issues. The parties were not able to come to any agreements on the first two issues dealing with the adequacy of the proposed groundwater remedy and waiver of certain applicable or relevant and appropriate requirements (ARARs) based on technical impracticability. They were able to reach some measure of agreement on the second two issues dealing with institutional controls and the action leakage rate for the disposal cell. While not fully resolving the third issue, the parties discussed putting more specific language in the Groundwater Operable Unit Record of Decision (ROD) on the type of institutional controls and mechanisms for enforcement. Relative to the fourth issue, the parties agreed that the action leakage rate for the on-site disposal cell would be recalculated, and that any agreements reached on groundwater monitoring for purposes of the groundwater operable unit would not be used to limit cell closure and post-closure monitoring plans.

The outstanding issues were then elevated to the program manager level. In conjunction with this process, MDNR revised its statement of the issues in a January 12, 2000, letter, a copy of which is enclosed as Enclosure C. The parties met at the program manager level by conference calls on January 14 and January 21, 2000, to discuss these issues. While the issues and some possible resolutions were discussed at length, no agreement was reached. When it became apparent that prolonging discussions at this level was not likely to resolve the issues, the decision was elevated to the Regional Administrator.

The process called for the Regional Administrator to make a decision on the unresolved issues after consulting with senior officials from MDNR and DOE. To facilitate this consultation, the parties met at the Regional Office on January 28, 2000. Prior to this meeting, the parties submitted a concise statement of their positions on each of the issues. These position statements were compiled into a document entitled "Weldon Spring Remedial Action–Groundwater Operable Unit Dispute Summary of Agency Positions," dated January 25, 2000 (January 25 Position Summary). A copy of this document is enclosed as Enclosure D.

Much of the discussion at this meeting focused on MDNR's view that groundwater could be effectively extracted and treated to remove 2,4-DNT, nitrates, and uranium, and that drinking water standard-based ARARs should not be waived without first trying a localized field-scale enhanced groundwater extraction system. The parties agreed to delay a decision on this issue for a brief period to allow MDNR's Division of Geology and Land Survey (DGLS) to review

existing data and to propose such a system for the parties to consider. By letter dated March 10, 2000, DGLS forwarded its recommendations regarding additional efforts to address groundwater contamination at the Site. A copy of this letter is enclosed as Enclosure E.

The EPA appreciates Dr. Williams and the DGLS lending their effort and expertise to this matter. EPA has now considered the information and recommendations presented in his letter along with the other information presented in the course of this process. EPA evaluated this information in the context of the remedy selection criteria in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the National Contingency Plan (NCP) and applicable EPA policy and guidance. EPA first considered whether DGLS's March 10 letter presented sufficient new information about conditions at the site and possible treatment technologies to warrant postponing the Groundwater Operable Unit ROD for up to a year, or more, to allow for field testing before making a final remedy selection. EPA agrees with many of the points made in the March 10 letter and we believe that it provides a good description of the types of data necessary to improve understanding of the quantities and disposition of contaminants. We also agree that extensive pilot study would provide further data in this regard and would support a more refined estimate of how effectively contaminants could be recovered through groundwater extraction.

However, in considering whether to pursue a remedial alternative, the immediate objective of the Remedial Investigation and Feasibility Study is not to exhaust all avenues for data gathering in order to define the performance of a remedial alternative. Rather, its purpose is to gather sufficient information to put boundaries on performance and allow an estimate of restoration potential. In this case, EPA believes sufficient information is currently available to select a remedy for the Groundwater Operable Unit. As provided in Section 300.430(a)(1) of the NCP, one of the basic principles of CERCLA is that "Remedial actions are to be implemented as soon as site data and information make it possible to do so." Thus, the Groundwater Operable Unit ROD should not be delayed pending further field testing.

Having concluded that the remedy selection process should proceed, EPA then considered the specific issues raised by MDNR in the dispute, including consideration of the information in DGLS's March 10 letter, to determine whether the current proposal for groundwater remediation should be modified. The issues will be addressed in the same order they were presented in the January 25 Position Summary. The first two issues concern whether DOE has proposed an appropriate remedial action for groundwater contamination at the site. This issue was discussed at great length in the January 28 meeting and it was the primary focus of DGLS's March 10 letter. Briefly stated, the two sides to this issue are as follows: (1) MDNR contends that DOE has not exercised all possible means of removing contaminated groundwater from some areas of the site and that drinking water standard-based ARARs should not be waived at this time based on technical impracticability because DOE has not field tested all potential technologies; (2) DOE counters that while it has not pilot-tested particular technologies, it has made sufficient investigation from which to draw conclusions about which technologies might be effective and to conclude that in this geologic setting, there are no treatment technologies that

would be expected to fully remediate groundwater to drinking water standard-based cleanup levels. Furthermore, the sources of the groundwater contamination have already been removed so that contaminant levels in the groundwater should decrease through natural attenuation.

When evaluating the acceptability of a remedy, the CERCLA remedy selection process requires EPA to consider many factors. As stated in the NCP, EPA's expectations for contaminated groundwater are as follows:

"EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site. When restoration of ground water to beneficial uses is not practicable, EPA expects to prevent further migration of the plume, prevent exposure to the contaminated groundwater, and evaluate further risk reduction." (40 C.F.R. § 300.430 (a)(l)(iii)(F))

In general, drinking water standards are considered relevant and appropriate cleanup levels for groundwaters that are a current or future source of drinking water, but are not relevant and appropriate for groundwaters that are not expected to be a future source of drinking water (Preamble to the 1990 NCP, 46 Fed. Reg. 8732, March 8, 1990). At the Chemical Plant Area of the Weldon Spring Site, the DOE has conservatively identified the impacted groundwater as a potentially usable drinking water source and DOE has identified drinking water standards as being relevant and appropriate requirements for remediation of the contaminated groundwater. The area over which ARAR or risk-based cleanup levels are to be attained is defined in the NCP as follows:

"For ground water, remediation levels should generally be attained throughout the contaminated plume, or at and beyond the edge of the waste management area when waste is left in place" (NCP Preamble at 8713).

Thus, the edge of the waste management area, or in this case the disposal facility area, can be considered the point of compliance for meeting ARARs or risk-based cleanup levels. Beyond the edge of the disposal facility, EPA considers ARARs to have been attained only if they are met throughout the contaminated plume. If full restoration is not practicable, i.e., if ARARs cannot be met throughout the contaminant plume beyond the edge of the disposal facility, EPA expects to implement an alternative strategy as described in the program expectation statement above and further defined in "Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration" OSWER Directive 9234.2-25. EPA believes the existing data base is sufficient to meet the expectations of the Technical Impracticability (TI) evaluation components provided in this guidance, and that the data strongly support the interpretation that contaminated groundwater cannot be fully remediated to drinking water standard-based levels for all contaminants within a reasonable time frame. Potential remediation technologies might be effective in localized areas but would not be able to achieve ARARs across the entire site. Therefore, the groundwater remedy should contain an alternate strategy as described in the guidance that prevents exposure to contaminated groundwater, employs source

control, and evaluates further risk reduction measures as appropriate. The alternatives should be evaluated using the nine remedy selection criteria to determine the most appropriate remedial strategy for the site as provided in Section 300.430(f) of the NCP.

Comprehensive source control has already been accomplished with implementation of the1993 ROD for remedial action at the Chemical Plant Area. The current proposed plan contains provisions for institutional controls to restrict groundwater use and to prevent exposure to the contaminated groundwater. The remaining issue then is to determine what further risk reduction measures could be taken. In the case of the current proposal, and as all three parties agreed to at the time, the potentially viable remedial technologies were evaluated on a zone-by-zone basis to assess the potential for and the impacts of localized cleanup. The evaluation looked at factors having a bearing on the NCP's primary balancing criteria of long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost.

Active remediation of trichloroethylene (TCE) through an in-situ oxidation process emerges from the evaluation as an option worth pursuing because it can be implemented over the near-term, it is relatively cost-effective, it results in the reduction of toxicity through treatment, and it results in measurable risk reduction through remediation of TCE, which is a principal risk driver. Due to the complex karst-like hydrology, the effectiveness of this technology is far from certain, but the short implementation time-frame, low cost, and minimal potential for adverse consequences support going forward with this option.

Following the same decision-making process for localized pump and treat, with or without reinjection, results in a different outcome. Groundwater pump and treat is by nature a long-term commitment, and in this circumstance, it is very complicated and technically uncertain at best. Optimistic estimation of remediation time-frames indicates that pump and treat would not significantly reduce overall remediation time-frames over natural attenuation. The areas of the site where groundwater extraction might be sustainable are limited and difficult to locate or define. While some localized reduction in nitrate levels might be effected, it is unlikely that realistic and measurable remedial goals reflective of significant risk reduction can be developed or achieved. This is a point that was discussed extensively during our meeting on January 28 and was to be addressed in DGLS's March 10 letter; however, the letter did not seem to present any significant new guidance or insights in this regard. To the extent reinjection is necessary to make this technology viable, there is significant potential to have unpredictable impacts on contaminant migration. In short, the effectiveness of this approach is highly uncertain, and the potential payoff in terms of risk reduction is small. Thus, EPA does not agree with MDNR's position that groundwater pump and treat should be a component of the remedial action or that the ROD should be delayed until field testing this technology can be completed.

However, EPA recommends that DOE agree to perform a pilot-scale study designed to further define the level of application and effectiveness of groundwater pump and treat consistent with the recommendation in Dr. Williams' letter. Timing of the field work should be such that it

does not interfere with implementation of the in-situ oxidation of the TCE or with monitoring the effectiveness of this action. Consistent with the DGLS' March 10 letter, EPA anticipates the study period being from several months to a year in duration. The NCP provides for periodic review of remedies, so that if new information were to become available that substantially altered the conclusions that form the basis of the groundwater operable unit decision, then this decision may be revisited.

The MDNR also recommends that groundwater remediation be augmented through the installation of passive treatment systems at the springs. The presence of contamination in the seeps seems to be the only basis provided for recommending such action. EPA's review of the public health and ecological risk assessments indicates that contaminant concentrations found in springs, including Burgermeister Spring, are at levels that pose potential risks within the range EPA considers to be acceptable. With source removal already completed, water quality in the springs is expected to improve with time. If contaminant levels do not exceed ARARs and do not present an unacceptable risk, there is no CERCLA basis for recommending that this action be taken.

The third issue has to do with post-construction site management issues. The MDNR has concerns about the lack of specifics with regard to the mechanisms and responsibilities for institutional controls, operations and maintenance, funding assurances, and other "stewardship" matters. The MDNR recommends a separate stewardship ROD because it would provide greater enforceability and enhance state and public participation in the stewardship process. EPA also wants to see full stakeholder participation in the development of a stewardship plan that defines the terms of post-construction site management. However, EPA does not consider a ROD to be the appropriate CERCLA mechanism to establish the details of these stewardship issues. A ROD is intended primarily to establish performance goals for the remedy. While the feasibility of achieving these goals needs to be established in the Feasibility Study or other supporting documents, the precise nature of the remedy is established through the remedial design and remedial action process. Similarly, EPA considers DOE's long-term site stewardship planning to be a component of remedial design and consistent with operation and maintenance planning, which EPA anticipates being primary documents under the FFA.

On the fourth issue, EPA remains willing to enter into negotiations with DOE and MDNR aimed at making the state of Missouri a party to the FFA. EPA would be willing to consider a two-phased approach to adding the state as a party, with the first phase making only the most essential changes necessary to include the state as a party and the second phase making more substantive changes to address specific concerns. However, EPA believes the timing of the Groundwater Operable Unit ROD should not be tied to amendment of the FFA and does not agree to withhold its concurrence on this ROD until the FFA is amended.

Regarding the fifth issue, EPA believes, and all parties seemed to agree, that the Action Leakage Rate should be developed as part of the post-closure planning for the disposal cell and that it is not an issue for the Groundwater Operable Unit ROD. Post-closure performance monitoring for the cell will not be limited by any determinations made as part of the Groundwater Operable Unit ROD.

The remaining two issues have to do with MDNR's seeking a commitment from DOE to fund MDNR to perform perpetual site surveillance and oversight and to conduct an assessment of natural resource injuries at the site. EPA considers it appropriate for DOE and MDNR to discuss these issues and EPA hopes that these discussions will lead to a mutually satisfactory outcome. However, EPA does not consider these issues to be so directly related to the effort to select a remedy for the Groundwater Operable Unit so as to warrant delay of the Groundwater Operable Unit ROD until DOE and MDNR have reached an agreement.

In conclusion, EPA believes that the existing body of information is sufficient to form the basis for a final decision on an appropriate groundwater remedy. Further, the existing body of information strongly indicates there is low probability that an appropriate measure of effectiveness can be achieved through groundwater extraction techniques. DOE should include in the Groundwater Operable Unit ROD sufficient discussion and analysis on stewardship goals to define the direction of post-ROD planning. The Groundwater Operable Unit ROD should not be delayed pending revision of the FFA. The remaining issues do not directly affect the decision. Thus, EPA recommends moving forward with a final ROD based on the existing proposed plan including:

- In-situ oxidation of TCE with a remedial objective of meeting the drinking water standard Maximum Contamination Level (MCL) for TCE.

- Waiver of the MCL for nitrate and the state water quality standard for 2,4-DNT based on TI consistent with OSWER Directive 9234.2-25. EPA understands that the Army is currently investigating nitroaromatic contamination on the adjoining Weldon Spring Ordnance Works. Any decision regarding waiver of ARARs for the Ordnance works, including any determination relative to 2,4-DNT, will of course have to be made on a site-specific basis after completion of appropriate investigations.

- Long-term groundwater monitoring designed to establish the effectiveness of source remediation and verify that contaminant levels are diminishing with time.

- Institutional controls restricting the use of contaminated groundwater for drinking water purposes.

- Establish the five-year review process.

This letter concludes the formal dispute resolution process initiated by EPA's October 14, 1999, letter. EPA anticipates providing a copy of this letter to the Citizens Commission along with an offer to meet with the Commission and any interested members of the public to discuss the outcome of this process. If the Commission feels such a meeting would be useful, we hope that MDNR and DOE would also be willing to participate to give the Commission an opportunity to hear each party's view on the issues considered.

Again, thank you for the time and effort you and your staff devoted to this process. If you would like to discuss the conclusions reached in this letter, feel free to contact me at 913-551-7006 or Michael Sanderson, Director of the Superfund Division, at 913-551-7050.

Sincerely,

Dennis Grams, P.E.
Regional Administrator

Enclosures (5)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

OCT 14 1999

RECEIVED
OCT 18 1999
HAZARDOUS WASTE PROGRAM
MISSOURI DEPARTMENT OF
NATURAL RESOURCES

Ms. Cindy Kemper
Director, Hazardous Waste Program
Division of Environmental Quality
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, Missouri 65102-0176

Mr. Steve McCracken
United States Department of Energy
Weldon Spring Site Remedial Action Project
7295 Highway 94 South
St. Charles, Missouri 63304

Dear Mr. McCracken and Ms. Kemper:

Re: Weldon Spring Site Groundwater Operable Unit

This responds to Ms. Kemper's letter of September 27, 1999, requesting that unresolved issues pertaining to the proposed remedial action for the Groundwater Operable Unit (GWOU) be elevated to the Senior Executive Committee for resolution. As we discussed in our September 10, 1999, meeting, since the state of Missouri is not a party to the First Amended Federal Facility Agreement (FFA) in the matter of the Department of Energy's (DOE) Weldon Spring Site, the Missouri Department of Natural Resources (MDNR) cannot invoke dispute resolution under the FFA. However, since the Environmental Protection Agency (EPA) is also committed to trying to reach a mutually satisfactory resolution of the outstanding issues and takes seriously all the state's concerns, we suggest that EPA, DOE, and MDNR agree to follow a process similar to the FFA's dispute resolution procedure to address the remaining issues.

We understand from your letter that two issues may have been resolved, however, we are not clear on the status of the remaining issues. We suggest the parties adopt the following procedure to attempt to resolve the remaining issues:

1. Within two weeks of the effective date of this agreement, MDNR, as the disputing party, would submit, in writing, a statement of the remaining issues the state of Missouri has with respect to the proposed remedial action, the technical and legal basis for this position, and the proposed changes necessary to satisfy its concerns.

2. Designated agency representatives, consistent with EPA's branch chief level, would have 21 days from receipt of MDNR's submittal to meet, in person or by teleconference, to resolve the dispute. If the dispute is resolved to everyone's satisfaction, a written statement would be prepared setting forth the issue and manner in which that issue was agreed to be resolved.

3. At the conclusion of this 21-day time period, if any party does not agree that the dispute has been fully resolved at the branch chief level, the parties will have two weeks from the end of the 21-day period to meet again, at the program manager level, to attempt to resolve the dispute. If the dispute is resolved to everyone's satisfaction, a written statement would be prepared setting forth the issue and manner in which that issue was agreed to be resolved.

4. At the conclusion of this two-week time period, if any party does not agree that the dispute has been fully resolved at the program manager level, the Regional Administrator will decide all remaining issues, after having the opportunity to consult with senior officials within MDNR and DOE.

5. The public comment period will be extended for a time period to cover this process; i.e., an additional 60 days from the date the notice of the extension is published. The expectation of the parties would be that the dispute resolution process could be completed during this extended comment period, so that information developed during this process could be included in the administrative record supporting the record of decision.

6. This agreement pertains only to the issues MDNR has raised in its comments on the GWOU proposed plan, and does not alter either DOE's or EPA's rights or obligations under the FFA or MDNR's rights to contest the remedy selected for the GWOU.

If you agree to this process, please note your agreement by signing in the space provided below. EPA will consider this agreement effective upon receipt of the signed pages from each party. EPA would like to resolve these issues as quickly as possible. If we have not heard back from you on this proposal by October 29, 1999, we will assume you are not interested in following this approach.

If you have any comments or questions on this proposal, please contact me at (913) 551-7050 or Dan Wall of my staff (913)-551-7710.

Stephen H. McCracken
Project Manager

Date

Cindy Kemper
Director
Hazardous Waste Program

October 27, 1999
Date

Sincerely,

Michael J. Sanderson
Director
Superfund Division

cc: John Young, MDNR

If you have any comments or questions on this proposal, please contact me at (913) 551-7050 or Dan Wall of my staff (913)-551-7710.

Stephen H. McCracken
Project Manager

10/22/97
Date

Cindy Kemper
Director
Hazardous Waste Program

Date

Sincerely,

Michael J. Sanderson
Director
Superfund Division

cc: John Young, MDNR

Mel Carnahan, Governor • Stephen M. Mahfood, Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

November 10, 1999

Mr. Mike Sanderson
Director of Waste Management Division
U.S. Environmental Protection Agency, Region VII
905 N. 5th Street
Kansas City, KS 66101

RE: Statement of Remaining Issues of Dispute for the Groundwater Operable Unit, Weldon Spring Site Remedial Action Project, Weldon Spring, Missouri

Dear Mr. Sanderson:

In accordance with the agreed to procedure for resolution of dispute, we are providing statements to clarify the remaining issues, the basis for our position, and the proposed changes necessary to satisfy our concerns on each issue. The remaining issues of dispute for the Groundwater Operable Unit at this site are as follows:

Issue #1

The Department of Energy has failed to adequately address remediation of contaminated groundwater existing at or emanating from their site in the Proposed Plan.

Basis
The groundwater system beneath the DOE Weldon Spring Site Remedial Action Project (WSSRAP) site is considered a potentially useable potable aquifer according to the Department of Energy, the Environmental Protection Agency and the Missouri Department of Natural Resources. According to Laws and Regulations covering this type of situation, the cleanup standards that are to be met are the drinking water standards [121(d)(2A)].

A complete development of the alternatives to remediate contaminated groundwater at the site must be accomplished before a thorough and accurate comparison can be made and a preferred remedy selected. The capability of modeling and predictive models is limited due to the karst-like nature of the hydrogeology at this site. To compensate, a pilot-scale pump and treat system should be developed and tested in the field. If necessary, this system should include artificial recharge to reverse the effects of dewatering. Data could then be collected from this pilot project, which in turn could be used to evaluate the feasibility of a more complete remediation of the aquifer.

Alternatives including the passive treatment of contaminated groundwater that presently discharges off-site have not been explored. Other DOE sites are using such technology to

passively remediate uranium and nitrate contaminated groundwater to reduce the effects on the environment. The fact that Burgermeister Spring discharges a large percentage of the contaminated groundwater offsite lends its self to the practicability of installing a passive treatment system. Such systems can be low cost/low maintenance alternatives to more active means and must be considered.

Proposed Changes to Selected Remedy
Fully address existing groundwater contamination on site as well as contamination discharging offsite. The selected remedy must address current conditions as well as future discharges. Implement a pilot-scale pump and treat system. The remedy could include installation of a passive treatment system at points discharging contaminated groundwater as a component.

Issue #2

The Department of Energy inappropriately proposes to waive the Applicable or Relevant and Appropriate Requirements (ARARs) for water quality contaminants [2,4-Dinitrotoulene (2,4-DNT), nitrate, and uranium] for the entire site. Removal of contaminants is technically practicable in some areas or zones at this site. In addition, the proposed waiver does not provide a remediation goal if the ARARs are waived.

Basis
MDNR does not consider it technically impracticable to remediate 2,4-DNT, nitrate, or uranium in certain contaminant zones at this site. Based on information provided by DOE, some contaminant zones can be remediated to meet ARARs in a reasonable specified time. Failure to remediate the groundwater at this site has allowed contamination to migrate off-site and discharge at publicly accessible areas.

Proposed Changes to Selected Remedy
In line with the proposed remedy for Issue 1, the remedial action should include the installation of a pilot-scale pump and treat system to investigate whether waiver of ARARs is appropriate. If after evaluating the pilot-scale pump and treat system's performance and meeting ARARs is determined not to be practicable for all areas of contamination, alternate concentration limits must be developed as provided for in CERCLA section 121(d)(2)(B)(ii). At a minimum, contaminant discharges should be treated using a passive treatment system.

Issue #3

The Department of Energy has failed to fully and accurately address the Institutional Control component of the remedy they have identified for the site in the Feasibility Study or Proposed Plan.

Basis
The DOE has not clearly evaluated or assessed institutional controls; determined how this component provides for the long-term protection of human health and the environment at the site; or provided a definitive and enforceable plan.

Proposed Changes to Selected Remedy
The DOE must address and include; the purpose for the institutional controls, types of control, associated costs, long-term monitoring of compliance, a demonstration of the effectiveness of implementability, mechanisms of enforcement and the mechanism for funding long term oversight and necessary future remedial actions. The plan should include the ability to adapt if conditions change over time for the future and must be acceptable to the Missouri Department of Natural Resources.

Issue #4

The Department of Energy has failed to provide sufficient detail on how the Groundwater Operable Unit remediation and monitoring interface with monitoring and maintenance of the onsite disposal cell.

Basis
The selected remedy does not provide details, comparisons, and assurances on the interface between the groundwater monitoring and action leakage rate plan. In addition, DOE's proposal for action leakage rates for the cell is in adequate. The proposal is not in accordance with design values that the State has applied to other similar sites using U.S. Environmental Protection Agency guidance; contains inadequate factors of safety; lacks detail on leachate sump design and monitoring; and does not include the post-closure monitoring plan and action response plan.

Proposed Changes to Selected Remedy
The selected remedy must include a monitoring plan that differentiates how monitoring will distinguish between exiting contamination in the groundwater and possible leakage from the onsite disposal cell. To accomplish this a reasonable Action Leakage Rates must be developed for the onsite disposal cell along with a stepped approach plan to follow if action rates are triggered.

The Missouri Department of Natural Resources looks forward to resolving these issues in a timely manner. I will soon be contacting Gene Gunn and Steve McCracken soon to review options to address these issues as outlined in the process. If you have any questions regarding these issues in the interim, please do not hesitate to contact me at (573) 751-0763.

Sincerely,

HAZARDOUS WASTE PROGRAM

Robert Geller, Chief
Federal Facilities Section

RG:le

c: Steve McCracken, DOE/WSSRAP
Dan Wall, EPA Region VII

bc: Weldon Spring Citizens Commission
Daryl Roberts, Missouri Department of Health
James Fry, Missouri Department of Conservation
Ron Kucera, MDNR/Director's Office
Scott B. Totten, MDNR/DEQ
Ed Knight, MDNR/WPCP
Jerry Lane, MDNR/PDWP
Robert Eck, MDNR/SLRO
Jim Williams, MDNR/DGLS
Cindy Kemper, MDNR/HWP
Branden Doster, MDNR/HWP/FFS
Larry Erickson, MDNR/HWP/FFS

Mel Carnahan, Governor • Stephen M. Mahfood, Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

January 12, 2000

Mr. Steve McCracken, Project Manager
U.S. Department of Energy
Weldon Spring Site Remedial Action Project
7295 Highway 94 South
St. Charles, MO 63304

Mr. Mike Sanderson
Director, Superfund Division
U.S. Environmental Protection Agency, Region VII
901 N. 5th Street
Kansas City, KS 660101

RE: Dispute Resolution for the Groundwater Operable Unit, Weldon Spring Site Remedial Action Project

Dear Messrs. McCracken and Sanderson:

First of all, I'd like to thank you for continuing to work with the department to address our concerns over the groundwater ROD for the Weldon Spring site. Second, I'd like to acknowledge the time and effort already invested by Mr. Gene Gunn, Mr. Steve McCracken and Mr. Bob Geller in trying to resolve the dispute issues. We value the good working relationship among our three agencies and appreciate your continued efforts to arrive at a conclusion that we can all support.

To facilitate our conference call scheduled for 8:30 a.m. on January 14, 2000, I have enclosed a list of terms that I am authorized to request in order to resolve the current dispute at the program managers level. I have reviewed the elements of Options 1 and 2 developed at the Branch Chief level that were proposed to resolve the issues. Given the importance of these issues to my management, I felt it would ultimately save time to determine their comfort with these options prior to proceeding with further interagency discussions. The enclosed terms reflect my management's direction to me.

We will be discussing these terms in more details on Friday. However, as a general comment, the department is encouraged by the progress on the stewardship issue and discouraged by the lack of progress on the groundwater remediation issues. I sincerely hope that we can agree on additional groundwater remediation measures at the program managers level. If not, I have been directed to elevate all of the issues to the department director for resolution.

Thanks again for respecting our concerns by devoting your time and efforts to resolving these important issues.

Sincerely,

HAZARDOUS WASTE PROGRAM

Cindy Kemper
Director

CK:db

Enclosure

MDNR terms for dispute resolution - January 12, 2000

Level 2-Program Managers
Signing of ROD by end of June 2000 with the following conditions:

a) Fully and adequately address groundwater contamination existing at or emanating from the site. TCE treatment would begin as scheduled in current proposal. DOE would conduct a pilot project and further analysis of potential remedial options to address all contaminants of concern, including reinjection and recovery wells onsite. Also, DOE would evaluate and if appropriate, install a passive treatment system offsite at springs and seeps which discharge contaminated water.

b) If it is determined after efforts described in issue (a), that the ARAR for uranium, nitrates, 2,4-DNT and/or TCE cannot be met, then an appropriate process to establish alternative cleanup levels would be followed.

c) Prepare a separate Record of Decision for Stewardship that: addresses all areas impacted by the site; defines responsibilities; describes long term effectiveness; and provides adaptability of the plan. Specific items would include: authority, funding, stewards, operations, institutional and physical controls, information systems development, maintenance, and accessibility. The GWOU ROD would contain a commitment to finalize a separate stewardship ROD within a specified time period.

d) Revise the Federal Facilities Agreement (FFA) to include MDNR as a full participant to the agreement prior to signing the GWOU ROD and any future RODs.

e) Recalculation of the Action Leakage Rate facilitated by EPA and separation of the cell closure and post-closure issues from the groundwater monitoring issues until the requirements can be determined.

f) A commitment from DOE to work with MDNR to develop a funding mechanism to insure perpetual surveillance and oversight.

g) A commitment from DOE to fund MDNR to conduct an assessment of natural resource injuries at the site.

Weldon Spring Site Remedial Action Project- Groundwater Operable Unit Dispute
Summary of Agency Positions
January 25, 2000

a.) Fully and adequately address groundwater contamination existing at or emanating from the site. TCE treatment would begin as scheduled in current proposal. DOE would conduct a pilot project and further analysis of potential remedial options to address all contaminants of concern, including reinjection and recovery wells onsite. Also, DOE would evaluate and if appropriate, install a passive treatment system offsite at springs and seeps which discharge contaminated water.

MDNR position - DOE has not fully evaluated potentially viable technologies to remediate the groundwater contamination. While DOE proposes to remediate TCE, they do not plan to remediate uranium, nitrate or 2,4-DNT contamination. Uranium and nitrates have been detected off-site at levels of concern to MDNR. The State Geologist has provided his written opinion that reinjection technology has significant potential to reduce contaminant levels, and that the risk of using this technology in karst geology may be minimized through appropriate system design and monitoring. The benefits include reduced risk of exposure to contamination on-site and off-site, among others.

DOE position - TCE treatment can only begin under a CERCLA decision and none exists. Absent this ROD another decision would be required which would take many months and significant expense to complete. The state continues to suggest that there are other remedial options in addition to re-injection coupled with pump and treat yet none have been established by the RI/FS. As established in the RI/FS, re-injection will not work in this solution-enlarged geology because water will follow preferential pathways that likely will not reach the contaminants and/or will spread contamination to locations away from the extraction wells. Springs and seep contamination is the result of source materials, which have been removed, and the appropriate thing to do is long term monitoring to determine the effectiveness of the removal.

EPA position - EPA believes that in conjunction with complete source remediation, DOE's proposed remedial action fully and adequately addresses groundwater contamination consistent with the requirements of CERCLA. DOE proposed active remediation of the TCE (the principal risk driver) through an in-situ oxidation process with institutional controls to restrict consumption of the groundwater and long-term monitoring. Testing has demonstrated that shallow groundwater yields are low and not sustainable, and water levels are very slow to recover. Low yields in combination with complex structurally controlled flow patterns make the site an extremely poor candidate for groundwater extraction techniques. EPA believes that pump and treat, even on a localized basis (Zone 1) with enhancement through reinjection, has extremely limited potential to improve groundwater quality. Further, groundwater reinjection has a significant potential to exacerbate the problem by spreading contaminated groundwater to previously uncontaminated areas. Also, for the reasonable maximum exposure to offsite springs and seeps, i.e., recreational use, current and future risks are in the acceptable risk range and there is no risk-based reason for further evaluation of a passive treatment system at off-site spring(s).

b.) If it is determined after efforts described in issue (a), that the ARAR for uranium nitrates, 2,4 DNT and/or TCE cannot be met, then an appropriate process to establish alternative cleanup levels would be followed.

MDNR position - Waiver of ARARs at this time is inappropriate. Uranium has been detected above acceptable standards both on and offsite. DOE has not demonstrated that waiver of the ARARS for uranium due to Technical Impracticability exists. Waiver of 2,4-DNT can not be executed for the entire aquifer system until data is collected and compiled from the neighboring Weldon Spring Ordnance Works site. Nitrate and TCE ARARs can not be waived until all remedial options are considered and remediation of such contaminants is shown to be impracticable. If this condition were reached then alternative remediation goals would be appropriate.

DOE position - DOE agrees that the waiver for TCE water quality standards should only be granted if the proposed remedy fails. Waivers for other contaminants are appropriate to this decision if it is concluded that water quality standards cannot be met by active remediation (ref. the RI/FS).

EPA position - DOE has proposed a remedial action for the TCE that will be designed to achieve the drinking water standard-based ARAR. EPA believes that it is not technically feasible through active remediation to achieve ARARs throughout the plume for the other contaminants and therefore technical impracticability waivers for the other ARARs under the NCP and EPA policy is appropriate. EPA also believes that it is not technically feasible to achieve a useful alternate remediation goal that falls short of meeting ARARs even when examined on a localized basis.

c.) Prepare a separate Record of Decision for Stewardship that: addresses all areas impacted by the site; defines responsibilities; describes long term effectiveness; and provides adaptability of the plan. Specific items would include: authority, funding, stewards, operations, institutional and physical controls, information systems development, maintenance and accessibility. The GWOU ROD would contain a commitment to finalize a separate stewardship ROD within a specified time period.

MDNR position – The proposed ROD for the Groundwater Operable Unit lacks details related to Stewardship, and other WSSRAP RODs contain little or no information about Stewardship. MDNR acknowledges DOE's recent efforts to develop a Stewardship Plan. However, given the great importance of Stewardship issues to Missouri at a site of this nature, MDNR believes that a separate Stewardship ROD holds advantages over a less formal document, including: greater enforceability; enhanced public participation via the CERCLA process; and a more thorough consideration of all options. A separate ROD also makes it easier for the public and future stewards to find the answers to their Stewardship questions in one highly visible document, rather than searching through other less accessible documents. The groundwater ROD would need to include an enforceable commitment and associated timeframes for developing a separate Stewardship ROD.

DOE position - There is no basis under CERCLA for a "Stewardship ROD". The requirement for stewardship elements such as institutional controls, monitoring, etc., are contained within this ROD and existing RODs. The DOE has agreed to incorporate Stewardship planning within a primary document under the Federal Facilities Agreement in order to assure an enforceable process for this important activity.

EPA position - EPA believes the separate Stewardship ROD proposed by MDNR is not consistent with the function of a ROD in the CERCLA process. A ROD is intended to establish performance goals for the remedy as indicated by EPA's ROD guidance which says a ROD is "primarily a technical document that provides information for determining the conceptual engineering components, and which outlines the remedial action objectives and cleanup levels for the selected remedy." Remedial design documents and operation and maintenance plans are more appropriate mechanisms to establish the operational particulars of long-term site management.

d.) Revise the Federal Facilities Agreement (FFA) to include MDNR as a full participant to the agreement prior to signing the GWOU ROD and any future RODs.

MDNR position - MDNR wishes to become a party to the FFA so that Missouri has expanded authority to participate in Stewardship planning at WSSRAP. This needs to occur prior to signing the groundwater ROD or MDNR cannot be assured of a greater role in the Stewardship planning process. The Missouri Attorney General's Office has reviewed the existing FFA and concluded that only minor changes are needed before Missouri could sign as a party. Therefore, we do not believe that amending the FFA should lead to protracted delays in finalizing the groundwater ROD. While EPA and DOE have suggested that an MOU could serve in place of the FFA until the FFA is amended, MDNR does not believe that an MOU is as enforceable as the FFA, and questions the wisdom of developing both.

DOE position - The State is welcome to become a party to the FFA. Based on past experience, however, this will take many months to definitize and should only be pursued independent of the ROD. The DOE has suggested that a three party MOU specific to Stewardship would provide the State the same authority that they would have under an FFA and would provide a bridge to that point in the future when the FFA could be modified to include the State.

EPA position - EPA is willing to modify the FFA to include MDNR as a party and would agree to work with DOE and MDNR to accomplish this, but does not agree that the GWOU ROD should be delayed until the FFA has been amended. Under the most optimistic time-line we can envision, it would take a minimum of six months, and very likely much longer than that, to negotiate appropriate changes, submit these changes to the public for review and comment, consider public comments, and complete the signature process for all three agencies. Making signature of the ROD contingent upon successful completion of the revised agreement would lead to an open ended delay in signing the ROD.

e.) Recalculation of the Action Leakage Rate (ALR) facilitated by EPA and separation of the cell closure and post-closure issues from the groundwater monitoring issues until the requirements can be determined.

MDNR position - It is important for procedures to be in place to reliably distinguish between contamination from leaks in the containment cell, and pre-existing contamination in groundwater. The draft groundwater ROD did not address this issue to MDNR's satisfaction. Subsequent discussions have resulted in an agreement to recalculate the "Action Leakage Rate" from the cell during a deliberative process facilitated by EPA. MDNR believes this process will resolve this issue.

DOE position - This issue is not relevant to this Groundwater ROD in that this ROD does not cover leakage from the disposal cell. The DOE is agreeable to adding wording to this ROD that would expressly state that waivers of ARARs do not apply to leakage from the cell. Further, the DOE is agreeable to the EPA arbitrating the Action Leakage Rate (ALR) to the secondary leachate collection system based on EPA regulations, however this should be independent of the ROD.

EPA position - EPA is agreeable to this and believes that this matter should be pursued in conjunction with the general effort to establish operation and maintenance plans for the cell that allows for confirmation that the cell is functioning properly over the post-closure period.

f.) A commitment from DOE to work with MDNR to develop a funding mechanism to insure perpetual surveillance and oversight.

MDNR position – It is our understanding that DOE is committed to working with MDNR toward a funding vehicle for perpetual site monitoring and maintenance. Additional definition of expectations, restrictions, and other details of responsibilities primarily related to maintenance are necessary in order to proceed. However assuming agreement on the details is reached, this issue can be resolved.

DOE position - The DOE has stated a willingness to discuss funding only if it would eventually result in the State using the funds to take over surveillance and maintenance of the disposal cell. (The recent agreement between DOE and the State of Tennessee is used as an example) It is understood that a successful outcome to such discussions could be a lengthy process including issues such as whether statutory authority exists, a determination of funding availability and source, etc.

EPA position - EPA is hopeful that DOE and MDNR can come to terms on this matter, but this process should be conducted independent of the ROD process.

g.) A commitment from DOE to fund MDNR to conduct an assessment of natural resource injuries at the site.

MDNR position – It is our understanding that there is a process established to allow for federal DOE funding of natural resource injury assessment. A commitment from DOE is necessary to fund MDNR to conduct an appropriate Natural Resource injury assessment. It appears that this issue can be resolved if additional details are provided by DOE.

DOE position - DOE is committed to meeting the requirements of the Natural Resources Damages Act (NRDA). Any natural resource damages assessment should include all natural resource trustees and should be carried out after the remedy of the site is complete and damages, if any, can be accurately determined.

EPA position - EPA is hopeful that appropriate arrangements are made to address any natural resource damages, but this process should be conducted independent of the ROD process.

87354

Mel Carnahan, Governor • Stephen M. Mahfood, Director

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
P.O. Box 250 111 Fairgrounds Rd. Rolla, MO 65402-0250
(573) 368-2100
FAX (573) 368-2111

March 10, 2000

Mr. Dennis Grams, P.E.
Regional Administrator
Region VII, EPA
901 N. Fifth Street
Kansas City, MO 66101

Re: Weldon Spring Site Remedial Action Project – Groundwater Operable Unit Dispute

Dear Mr. Grams:

At the January 27, 2000 meeting held at your office between your agency (EPA), the Missouri Department of Natural Resources (MDNR) and the Department of Energy (DOE), you requested that I personally review any necessary data, including data on the pilot pumping test developed at the Weldon Spring Site for the groundwater operable unit, and provide you with a recommendation on conducting additional investigations or remedial actions to address groundwater contamination existing at or emanating from the site. To that end, on February 9, 2000 I met with my staff and technical staff working at the site to review the geohydrologic setting of and the pilot pumping test conducted at the site. After reviewing this information, it is clear to me that technical inability to remove significant amounts of contaminants of concern has not been demonstrated by DOE.

After reviewing the data from the most recent pump test in the southeast portion of the site, it appears that contaminated groundwater can be extracted from the shallow aquifer in substantial quantities, and perhaps even at sustainable yields, though the pumping test was terminated before a sustainable yield was determined. The report of that pumping test (DOE/OR/21548-757, Rev. 0, Oct. 1998) estimated that the transmissivity of the aquifer ranged from 6,400 to 7,600 gallons per day per foot of drawdown, which is sufficient for the needs of a small public water supply district. That report optimistically reported that the aquifer..."is more transmissive than previously suggested." The authors of the September version of the same report (Rev. A) were even more optimistic, concluding that the aquifer..."is amenable to groundwater recovery using conventional wells." And this is without considering the potential

benefits of artificial recharge of the aquifer or unconventional recovery techniques such as horizontal or fractured wells.

It is also clear that there is a lack of some data which appears to be key to the decision to commit additional resources to a groundwater remediation effort. The mass of contaminants located in the shallow aquifer of the different contaminant zones is unknown, without which it is uncertain if a meaningful amount of contaminant mass can be removed using extraction alone or extraction with artificial recharge. The mass of contaminant that would be removed by an extraction system and whether that mass is considered meaningful can be better understood after estimating the contaminant mass present and operating a pilot study or full-scale remedial project which measures amounts of contaminants removed. It is unknown what mass of contaminant is present in the fracture system versus the porous media matrix or at what rate the contaminant will diffuse and/or drain from the porous media to the fracture system under remedial conditions. In addition, the contaminants of concern may respond differently to a remedial effort. The highly soluble nitrates, for instance, may readily be removed from the aquifer by sufficient groundwater withdrawal, whereas the less soluble nitroaromatic compounds and TCE may require repeated flushing of the aquifer through artificial or natural recharge. A pilot study should be conducted to collect the data needed to determine how effectively contaminants can be extracted (mass removal curves) from the aquifer. Mass removal curves would help determine the effectiveness of a full-scale remedial effort at removing meaningful amounts of contaminant. The long term pumping test performed at the site gives some indication of the removal efficiency achievable with one conventional well for one contaminant; an estimated 1.2 pounds of TCE was removed during the 18-day test. However, insufficient data were collected on recovery of nitrates or nitroaromatic compounds and for other pumping scenarios.

From the perspective of contaminant migration, it is clear that the potential benefits of operating a remedial system outweigh the possible concern of inducing further contaminant migration. It is already known that the contaminants will naturally migrate off site – they have been for many years – as demonstrated by groundwater sampling at wells and local springs, the many dye-tracing studies that have been conducted at the site and by the shape of the potentiometric surface. There is even recent optimistic evidence that the aquifer will respond to remediation within a reasonable time period. At the February 9 meeting it was reported by DOE contractors that the potentiometric surface in the vicinity of the former raffinate pits has receded by about 3 feet since the pits were drained in the last year. Pilot study operational parameters during a reasonable study period should be varied to determine optimal efficiencies. Such a study period is likely to take several months to perhaps over a year to conduct. In the mean time, the Fenton oxidation process for the treatment of TCE should not be delayed due to development of the extraction/recharge pilot study. Data from the Fenton process could be helpful in design or conduct of the pilot study.

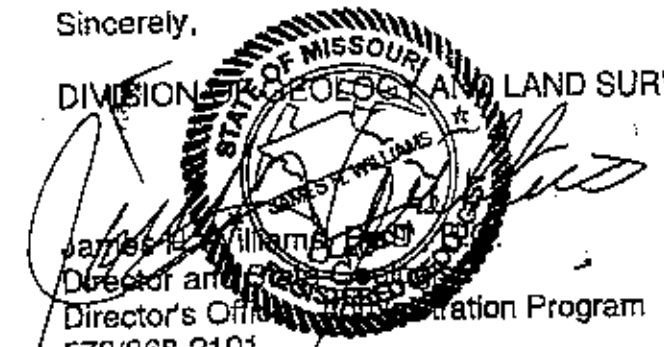
The extraction of contaminated groundwater, with or without artificial recharge, should be implemented at optimal location(s) and in a controlled, step-wise approach. The determination of optimal locations, with respect to the different zones of contamination

at the site and the specific conditions at each zone, can only be determined by careful monitoring and pilot testing. A technically feasible augmentation to active pumping of the aquifer is the installation of passive treatment systems at springs discharging contaminated groundwater.

In summary, the DOE has not shown that extraction of meaningful amounts of contaminated groundwater is infeasible. I recommend that the DOE calculate the amount of all of the contaminants of concern and then conduct pilot studies to determine what quantities of the contaminants can be extracted under different pumping and artificial recharge scenarios. During these studies area wells and springs should be monitored to determine if increased off-site migration of contaminants occurs. Passive treatment systems at springs that are receiving contaminants should also be considered. Only after such studies will it be known what quantities of contaminants are realistically recoverable.

Sincerely,

DIVISION OF GEOLOGY AND LAND SURVEY



James L. Williams, P.G.
Director and State Geologist
Director's Office, Remediation Program
573/368-2101
573/368-2111 (Fax)
nrwillj@mail.dnr.state.mo.us

c: Mel Carnahan, Governor of Missouri
Steve Mahfood, Director, DNR
Steve McCracken, DOE-Weldon Spring
Weldon Spring Citizens Commission